How Misplaced Loyalties are Harming the Profession

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Introduction

Professional codes before World War II mainly pertained to people's entry into the profession and etiquette. The scientific experiments and other immoral uses of technology during the war however lead many professions to change their code of ethics to ensure their members would not engage in such acts again. The American Society of Civil Engineers (ASCE) followed suit and in 1976 adopted Cannon 1 stating that engineers "should hold paramount the safety, health and welfare of the public" [1]. Although not as obvious, the civil engineering profession is currently facing another crisis that is placing the public in harm's way. This crisis stems from a lack of integrity in the profession itself. Although not as horrific as scientific experiments carried out on humans, corrupt acts by civil engineers can sometimes end tragically as well. Just like it did in 1976, ASCE needs to change its ethical standards and how these ethics are taught to engineers if it wishes to maintain the integrity of the civil engineering profession.

Because of the way engineers are educated about ethics, civil engineers are more frequently placing the needs of their employers over the needs of the public. The civil engineering profession needs to adopt the philosophy of care ethics if it wishes to curb corruption and maintain the integrity of the profession.

Theories Comprising Modern Professional Ethics

In order to understand the state of the engineering profession today, we first need to understand the reason why individuals become engineers and the normative ethical theories that guide engineers in the practice of their profession. Van de Poel describes technological enthusiasm, effectiveness and efficiency, and human welfare as professional ideals that motivate individuals to become engineers [2]. Similarly, Donna Riley describes a desire to help, having a narrow technical focus, positivism, and an uncritical acceptance of authority as certain characteristics that comprise the engineering mindset [3]. From looking at these characteristics, it is clear how engineers can sometimes fall prey to corruption. Whether or not most of these ideals are morally commendable or reprehensible depends on the goals for which an engineer's design is used and the side effects created by it. For example, Wernher von Braun was the main designer of the Saturn V rocket which helped the Apollo astronauts land on the moon. He also was a Nazi SS officer who played a major role in the development of the V2 rocket during World War II. Von Braun stated that "My refusal to join the party would have meant that I would have had to abandon the work of my life" [2]. Von Braun is an example of how technological enthusiasm and positivism can be used for the wrong reasons. Even though ideals such as technological enthusiasm can be pursued for good or bad reasons, the one virtue out of the sets of ideals described by Van de Poe! and Riley that is different from the others is the pursuit of improving human welfare. When followed, this virtue gives purpose to the other virtues described and ensures engineers are not using their skills for the wrong reasons.

Traditionally, engineers learn these ideals through various normative ethical theories taught to them in school. The three main ethical theories that engineers are familiar with are consequentialism, deontology and virtue ethics [2]. The Cannon that this paper is concerned with, Cannon #6 of the ASCE Code of Ethics, is an example of deontological (duty) ethics. According to Immanuel Kant, the only truly ethical thing one can do is to act with a good will. A good will is not simply acting with good intentions but rather acting out of a sense of duty for a moral law. A moral law is determined through what Kant calls the categorical imperative, a system of reasoning from which all moral laws can be derived [2]. Cannon #6 states that engineers "shall act with zero tolerance for bribery, fraud, and corruption" [4]. From this cannon we can gather that ASCE has collectively determined that tolerating bribery, fraud, and corruption is a violation of the categorical imperative; thus, if an engineer tolerates fraud then they are not acting with good will. While this reasoning is sound behind why an engineer should act with good will, we will see how fraud is often a stronger motivator to act with unscrupulous behavior.

Professional Ethics of Civil Engineering Today

Civil engineers are failing to uphold the integrity of their profession because they have more loyalty to companies rather than the public. This loyalty to the bottom-line stems from the educational system. In the 1870s, the emergence of high-volume, low-cost production produced a demand for a different kind of engineer other than the entrepreneurial type trained under the apprenticeship model or the military engineers geared towards the needs of the state [3]. Neither model was suitable for the needs of industry and thus the Morrill Act of 1862 created the land grant universities to educate large numbers of working-class students [3]. The influence of industry on engineering education has only grown over time due to the simple fact that industry hires engineers. This mismatch of loyalties is what differentiates civil engineers from other professionals such as doctors and lawyers. Doctors and lawyers interact with the people they serve directly so there is no ambiguity about who they serve and who will suffer if they do not act with good will. Engineers on the other hand are separated from the people they serve through the tripartite model where the principals, engineers, and users all have their distinct functions and responsibilities [2]. Some would even go as far to describe engineers as not fitting the classic definition of a professional because they do not have the same kind of autonomy as doctors and lawyers do [3]. Engineers are required to act as part laborer, part manager, and all the while remain beholden to the desires of management, CEOs, shareholders, and the market.

This system has had consequences for the public since engineer's loyalties lie with their employers. The outcomes of this system are especially apparent in the construction industry where civil engineers play a large role. A lot of these projects involving corruption can have devastating effects on the environment, waste money, and negatively affect the surrounding population. Civil engineers involved in the planning and consulting of these projects perpetrate a form of corruption called "excessive appraisal optimism" [5]. Civil engineers engaging in this type of behavior are more likely to approve large infrastructure projects favored by corrupt politicians instead of offering alternatives for fear of being denied future contracts [5]. The Jatigede dam on the Cimanuk River, which is supposed to produce power and bring irrigation to the farmers of West Java, Indonesia, is an example of this type of corruption. It will submerge a land area of 49 km^2, drown 30 villages, and displace around 41,000 people [5]. In addition to the social cost, environmental experts agree that reforestation would better address the problems of floods and droughts [5]. Despite all the reasons to not approve this project, corruption in the government of Indonesia's development planning process is likely to blame for it being approved [5]. Sometimes these consequences are even deadly. A study done by Nicholas Ambraseys and Roger Bilham concluded that 83% of all deaths from building collapse in earthquakes over the past 30 years occurred in countries with high levels of corruption [6]. The main reason for these building collapses was poor construction oversight [6]. A 2005 report by Transparency

International identifies the construction industry as one of the most corrupt industries for the following reasons: "the fierce competition for 'make or break' contracts; the numerous levels of official approvals and permits; the uniqueness of many projects; the opportunities for delays and overruns; and the simple fact that the quality of much work is rapidly concealed as it is covered over by concrete, plaster and cladding" [5]. In countries that are poor and notoriously corrupt, it is easy for contractors and engineering firms to take advantage of these conditions and commit unethical acts such as using subpar building materials.

Civil Engineering and Care Ethics

Care ethics offers a way to maintain the integrity of the civil engineering profession by focusing on the most important ideal identified earlier: human welfare. Initially inspired by the work of Carol Gilligan, care ethics is defined as "an ethical theory that emphasizes the importance of relationships, and which holds that the development of morals does not come about by learning general moral principles" [2]. Care ethics offers an opportunity for civil engineers to hold true to their ideal of improving human welfare by forming personal relationships with those who will ultimately be affected by the infrastructure they design. A PhD dissertation by Ryan Campbell reveals the need for care ethics in the engineering education system. Campbell's research focused on the question: "In terms of care ethics, how do students in traditional engineering programs respond to problems of humanitarian or social justice nature" [7]. Analyzing student perspectives in various engineering contexts with what Campbell calls "the four moral elements of care: Attentiveness, Responsibility, Competence, and Responsiveness," he found that while some students exhibited these characteristics in their responses, there was an equal number of students who did not [7]. One of his key conclusions is that the engineering education system needs to formalize concepts of design, in branches of engineering that deal with the design of large-scale infrastructure, that are user-centered and participatory [7]. Infusing care ethics into engineering education offers a practical way to encourage future civil engineers to consider the needs of all stakeholders in a large-scale infrastructure project, not just their employers.

Not only does care ethics offer a path forward but engineering students and professors alike prefer it. One study introduced some first-year civil engineering students to the various ethical theories and found that ethics of care was the most popular ethical theory that students identified with [8]. The students that identified with care ethics also were more likely to participate in an optional service-learning outreach project in the course rather than a standard term paper, had more positive attitudes about the importance of stakeholders in the engineering process, and placed higher value on ethics to the profession of engineering than the students that identified with other normative ethical theories [8]. Another study surveyed engineering professors who taught engineering ethics courses to see what methods were most effective. It found that professors preferred to teach ethics with learning through service activities such as working with Habitat for Humanity or K-12 outreach. These service-learning projects embrace a core principle of care ethics which is learning through personal relationships [9].

Conclusion

If the civil engineering profession wishes to move past all these "pay-to-play" scandals and maintain the public's trust, it needs to get back to its most important core ideal: helping others. Rather than dictating to civil engineers they must help others because it is their "duty," as the traditional ethical theories have done, care ethics offers a more practical way of teaching this ideal to engineers. The emphasis on forming personal relationships is an idea that appeals to students and professors alike. Projects such as the Richard J. Scranton Outstanding Community Service Award are a good example of the type of activities that will help students develop into better engineers [10]. Only when civil engineers have a true care for all stakeholders involved will the "pay-to-play" scandals end, and the autonomy of the profession be restored.

References

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